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13. A method for controlling the acceleration of an armature of an electric drive, with means for generating a partly synthesized high quality acceleration error correction signal $\underline{z}$, comprising the steps of:

obtaining a measured armature acceleration value $\underline{b}_m$, equal to the product of a true armature acceleration α, measured by an accelerometer mechanically attached to the armature of the electric drive, and an acceleration measurement transfer function $F_g(p)$, having a complex frequency variable p whereby the function $F_g(p)$ equals one when p equals 0;

obtaining a measured acceleration signal, $\underline{b}_{Em}$, generated from a measured substitute acceleration signal $\underline{b}_E$;

scaling the measured armature acceleration value $\underline{b}_m$ and the measured acceleration signal $\underline{b}_E m$ such that the relationship of $\underline{b}_m = \alpha \bullet F_g(p) = \underline{b}_{Em} \bullet F_g(p)$ is satisfied;

filtering the measured armature acceleration signal $\underline{b}_m$ with a first filter transfer function of $F_T(p)$, to obtain a first filter output signal $\underline{x} = \underline{b}_m \bullet F_T(p)$, in which the first filter transfer function $F_T(p)$ has the complex frequency variable p;

filtering the measured acceleration signal $\underline{b}_E m$ with a second filter transfer function of $F_H(p)$, to obtain a second filter output signal $\underline{y} = \underline{b}_{Em} \bullet F_H(p)$; and

combining the first and second filter outputs to form the partly synthesized high quality acceleration error correction signal $\underline{z} = \underline{b}_m \bullet F_T(p) + \underline{b}_{Em} \bullet F_H(p)$.

14. The method according to claim 13, wherein:

the armature of the electric drive is a rotor set in motion;

the true armature acceleration α is a rotary acceleration;

the accelerometer mechanically attached to the armature of the electric drive operates on the Ferraris principle; and

the substitute acceleration signal $\underline{b}_E$ represents a torque $\underline{m}$ of the armature.

15. The method according to claim 14, wherein:

the electric drive is a rotary current drive; and

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the substitute acceleration signal $\underline{b}_E$ represents torque forming transverse current components $\underline{i}_q$ of a current volume indicator of a winding fed by a transverse current of the rotary current drive.

16. The method according to claim 14, wherein:

the electric drive is a direct current drive; and

the substitute acceleration signal $\underline{b}_E$ represents an armature current $\underline{i}_a$ of the direct current fed winding of the electric drive.

17. The method according to claim 16, wherein:

a limit frequency for the first filter is low enough such that if the direct current fed winding of the electric drive is energized by a multi-phase current produced by a pulse inverter, and an output voltage level indicator on the output operates on the principle of a discrete time change in switching condition control with a clock frequency in the range of 100 kHz directly from a two-point loop control which adjusts an instantaneous value of the partly synthesized high quality acceleration error correction signal $\underline{z}$ to a set value thereof, then no self excited oscillations arise in the two-point control loop for the partly synthesized high quality acceleration error correction signal $\underline{z}$.

18. The method according to claim 13, wherein:

the armature of the electric drive is an armature set in linear motion of a travelling wave guide;

the true armature acceleration α is a linear acceleration;

the accelerometer mechanically attached to the armature of the electric drive operates on the Ferraris principle; and

the substitute acceleration signal $\underline{b}_E$ represents a linear force f of the linear drive

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19. The method according to claim 18, wherein:

the substitute acceleration signal b_E represents a torque forming transverse current components $\underline{i}_q$ of the current volume indication of a winding fed by a transverse current of the linear drive.

20. The method according to claim 19, wherein:

a limit frequency for the first filter is low enough such that if the drive winding of the electric drive is energized by a direct current produced by a pulse inverter, and an output voltage is derived in accordance with the principle of a discrete time change in switching condition control with a clock frequency in the range of 100 kHz directly from a two-point control loop which adjusts an instantaneous value of the partly synthesized high quality acceleration error correction signal $\underline{z}$ to a set value thereof, then no self excited oscillations arise in the two-point control loop for the partly synthesized high quality acceleration error correction signal $\underline{z}$.

21. The method according to claim 13, wherein:

the limit frequency for the first filter is less than 10 kHz.

22. The method according to claim 13, wherein:

the transfer function $F_H(p)$ of the second filter is equal to $F_T(0) - F_T(p) \bullet F_g(p)$

23. The method according to claim 21, further comprising:

obtaining a measured armature acceleration value $\underline{b}_m$ equal to the product of $F_M(p)$, $F_g(p)$ and $\underline{b}_{Em}$, in which $F_M(p)$ describes a mechanical frequency response between the surface of the drive set in motion by the thrust of the drive, and a part of the accelerometer set in motion by the surface of the drive;

characterizing the transfer value of the second filter $F_H(p) = F_h(p) = F_T(0) - F_T(p) \bullet F_g(p) \bullet F_M(p)$; and

determining the limit frequency of the first filter and the first filter transfer function by taking into account the transfer function of the second filter.

24. The method according to claim 21, further comprising:

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obtaining a measured armature acceleration value $\underline{b}_m$ equal to the product of $F_M(p)$, $F_g(p)$ and $\underline{b}_{Em}$, in which $F_M(p)$ describes a mechanical frequency response between the surface of the drive set in motion by the thrust of the drive, and the part of the accelerometer set in motion by the surface of the drive;

separating from the transfer function $F_M(p)$ a portion $F_0(p)$ to further approximate the mechanical frequency response between the surface of the drive set in motion by the thrust of the drive, and the part of the accelerometer set in motion by the surface of the drive, wherein

$$F_0(p) = \frac{(1 + p \bullet T_\mu) \bullet (1 + 2 \bullet D_v \bullet p \bullet T_v + p^2 \bullet T_v^2) \bullet \ldots}{(1 + p \bullet T_i) \bullet (1 + 2 \bullet D_j \bullet p \bullet T_j + p^2 \bullet T_j^2) \bullet \ldots}$$

determining the transfer function $F_H(p)$ of the second filter as $F_H(p) = F_{h*}(p) \approx F_T(0) - F_T(p) \bullet F_g(p) \bullet F_0(p)$; and

determining the limit frequency of the first filter with the transfer function $F_{h*}(p)$ of the second filter being taken into account.

Sub C'

~~25. A controller for controlling the acceleration of an armature of an electric drive, with means for generating a partly synthesized high quality acceleration error correction signal $\underline{z}$, comprising:~~

~~an accelerometer mechanically attached to the armature of the electric drive to measure a true armature acceleration α, made available as a measured armature acceleration value $\underline{b}_m$, equal to the product of the true armature acceleration α and an acceleration measurement transfer function $F_g(p)$, the acceleration measurement transfer function $F_g(p)$ having a complex frequency variable p and being defined by the relationship $F_g(p)$ equals one when p equals 0;~~

~~means for measuring a substitute acceleration signal b_E, made available as a measured acceleration signal, $\underline{b}_{E}m$;~~

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means to scale the measured armature acceleration value $\underline{b}_m$ and the measured acceleration signal $\underline{b}_{Em}$ such that the relationship of $\underline{b}_m = \alpha \bullet F_g(p) = \underline{b}_{Em} \bullet F_g(p)$ is satisfied;

a first filter for filtering the measured armature acceleration signal $\underline{b}_m$ with a first filter transfer function of $F_T(p)$, to obtain a first filter output signal $\underline{x} = \underline{b}_m \bullet F_T(p)$, in which the first filter transfer function $F_T(p)$ has the complex frequency variable p and is further defined by the relationship $F_T(p)$ equals one when p equals 0;

a second filter for filtering the measured acceleration signal $\underline{b}_E$m with a second filter transfer function of $F_H(p)$, to obtain a second filter output signal $\underline{y} = \underline{b}_{Em} \bullet F_H(p)$; and

means for combining the first and second filter outputs to form the partly synthesized high quality acceleration error correction signal $\underline{z} = \underline{b}_m \bullet F_T(p) + \underline{b}_{Em} \bullet F_H(p)$.

26. The controller according to claim 25, wherein:

the armature of the electric drive is a rotated armature;

the true armature acceleration α is a rotary acceleration;

the accelerometer mechanically attached to the armature of the electric drive operates on the Ferraris principle; and

the substitute acceleration signal $\underline{b}_E$ represents a torque $\underline{m}$ of the armature.

27. The controller according to claim 26, wherein:

the electric drive is a rotary current drive; and

the substitute acceleration signal $\underline{b}_E$ represents a transverse current component $\underline{i}_q$ of a current volume indicator of a winding fed by a transverse current of the rotary current drive.

28. The controller according to claim 26, wherein:

the electric drive is a rotary current drive; and

the substitute acceleration signal $\underline{b}_E$ represents an armature current $\underline{i}_a$ of an armature winding of the direct current drive fed by a rotating current.

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29. The controller according to claim 28, wherein:

a limit frequency for the first filter is low enough such that if the armature winding of the electric drive is energized by a direct current produced by a pulse inverter, and an output voltage level is derived on the principle of a discrete time change in switching state with a clock frequency in the range of 100 kHz directly from a two-point loop control which adjusts an instantaneous value of the partly synthesized high quality acceleration error correction signal z to a set value thereof, then no self excited oscillations arise in the two-point control loop for the partly synthesized high quality acceleration error correction signal $\underline{z}$.

30. The controller according to claim 25, wherein:

the armature of the electric drive is an armature of a travelling wave drive in linear motion;

the true armature acceleration α is a linear acceleration;

the accelerometer mechanically attached to the armature of the electric drive operates on the Ferraris principle; and

the substitute acceleration signal $\underline{b}_E$ represents a linear force f of the linear drive

31. The controller according to claim 30, wherein:

the substitute acceleration signal $\underline{b}_E$ represents a torque forming transverse current components $\underline{i}_q$ of a current volume indicator of a winding of the linear drive energized by a multiphase current.

32. The controller according to claim 30, wherein:

a limit frequency for the first filter is low enough such that if the armature winding of the electric drive is energized by a multiphase current produced by a pulse inverter, and a current level indicator is derived in accordance with the principle of a discrete time change in switching state with a clock frequency in the range of 100 kHz directly from a two-point control loop which adjusts an instantaneous value of the partly synthesized high quality acceleration error correction signal $\underline{z}$ to a set value thereof, then no self excited oscillations arise in the two-point control loop for the partly synthesized high quality acceleration error correction signal $\underline{z}$.

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33. The controller according to claim 25, wherein:

the limit frequency for the first filter is less than 10 kHz.

34. The controller according to claim 25, wherein:

the transfer function $F_H(p)$ of the second filter is equal to $F_T(0) - F_T(p) \bullet F_g(p)$

35. The controller according to claim 25, further comprising:

means to determine a measured armature acceleration value $\underline{b}_m$ equal to the product of $F_M(p)$, $F_g(p)$ and $\underline{b}_{Em}$, in which $F_M(p)$ describes a mechanical frequency response between the surface of the drive set in motion by the thrust of the drive, and a part of the accelerometer set in motion by the surface of the drive, and in which the transfer value of the second filter $F_H(p) = F_h(p) = F_T(0) - F_T(p) \bullet F_g(p) \bullet F_M(p)$; and

the first filter with the first filter transfer function having a limit frequency determined by taking into account the transfer function of the second filter.

36. The controller according to claim 25, further comprising:

means to determine a measured armature acceleration value $\underline{b}_m$ equal to the product of $F_M(p)$, $F_g(p)$ and $\underline{b}_{Em}$, in which $F_M(p)$ describes a mechanical frequency response between the surface of the drive set in motion by the thrust of the drive, and a part of the accelerometer set in motion by the surface of the drive, and which separates from the transfer function $F_M(p)$ a portion $F_0(p)$ to further approximate the mechanical frequency response between the surface of the drive set in motion by the thrust of the drive, and the part of the accelerometer set in motion by the surface of the drive, wherein

$$F_0(p) = \frac{(1 + p \bullet T_\mu) \bullet (1 + 2 \bullet D_v \bullet p \bullet T_v + p^2 \bullet T_v^2) \bullet \ldots}{(1 + p \bullet T_i) \bullet (1 + 2 \bullet D_j \bullet p \bullet T_j + p^2 \bullet T_j^2) \bullet \ldots}$$

the second filter having a transfer function $F_H(p)$ defined as $F_H(p) = F_{h*}(p) \approx F_T(0) - F_T(p) \bullet F_g(p) \bullet F_0(p)$; and

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the first filter having a limit frequency in which the transfer function $F_{h*}(p)$ of the second filter is taken into account.

37. The method according to claim 13, wherein the first filter is a low pass filter, and the second filter is a high-pass filter.

38. The controller according to claim 25, wherein the first filter is a low pass filter and the second filter is a high-pass filter.

39. The method according to claim 13, wherein:

the function $F_T(p)$ equals one when p equals 0.

REMARKS

By the present Amendment, claims 1-12 are canceled and claims 13-38 are added to clarify the claims without narrowing the scope thereof and to obviate the objections under 35 U.S.C. §112, second paragraph. This leaves claims 13-38 pending in the application, with claims 13 and 25 being the independent claims.

Objections to Drawings

Proposed drawing changes are submitted to obviate the objections raised in the Office Action, with respect to 37 CFR §1.83(a) and 37 CFR §1.83(b). Contrary to the objection raised in the Office action regarding 37 CFR §1.83(b), the drawings are not incomplete. One skilled in the art of drive control systems would recognize the improvements the invention presents over the prior art from the modified drawings submitted.

The improvements comprise the characterization of the accelerometer and connection between the accelerometer and drive with transfer functions; the utilization of low and high pass filters with carefully chosen transfer functions (fully described in the specification) to filter the armature acceleration and torque respectively; and the combination of the outputs of the low and